AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A method for determining abnormal consumption of a utility by a system:

repeatedly measuring a level of use of the utility thereby producing a plurality of utility measurements;

employing a statistical procedure to identify ~~any~~ a set of outliers in the plurality of utility measurements;

removing the set of outliers from the plurality of utility measurements to define a set of non-outliers; and

evaluating performance of the system in response to ~~any~~ the set of outliers and the set of non-outliers ~~identified~~ by determining a severity of abnormal utility usage represented by ~~a given~~ each outlier in the set of outliers, wherein determining a severity of abnormal utility usage for each outlier comprises calculating how ~~many standard deviations the given~~ far each outlier is from ~~the average~~ a robust estimate value for utility usage determined from the set of non-outliers.

2. (Canceled).

3. (Previously Presented) The method as recited in claim 1 wherein determining a severity of abnormal utility usage comprises calculating how many standard deviations a given outlier is from the average value for utility usage by using the expression:

$$z_j = \frac{x_{e,j} - \bar{x}_{robust}}{S_{robust}}$$

where $x_{e,j}$ is the energy consumption for the j^{th} outlier, $\bar{x}_{robust}$ is a robust estimate of the average energy consumption for days of the same day type as outlier j, and S_{robust} is a robust estimate of the standard deviation of energy consumption for days of the same day type.

4. (Canceled).

5. (Previously Presented) The method as recited in claim 1 wherein determining a severity of abnormal utility usage comprises determining an amount that each outlier deviates from a mean of the plurality of utility measurements which are not identified as outliers.

6. (Original) The method as recited in claim 1 further comprising separating the plurality of utility measurements into groups wherein each group contains utility measurements acquired during days that under normal conditions have similar utility consumption levels; and

wherein the statistical procedure is applied separately to each group.

7. (Original) The method as recited in claim 1 further comprising separating the plurality of utility measurements into groups wherein each group contains utility measurements acquired during predefined time periods that under normal conditions have similar utility consumption levels; and

wherein the statistical procedure is applied separately to each group.

8. (Original) The method as recited in claim 1 wherein the outliers are identified using a Generalized Extreme Studentized Deviate (GESD) statistical procedure.

9. (Previously Presented) The method as recited in claim 8 wherein the Generalized Extreme Studentized Deviate (GESD) statistical procedure comprises:

(a) calculating an arithmetic mean ($\bar{x}$) of the plurality of utility measurements;

(b) finding an extreme utility measurement $x_{e,i}$ which is the utility measurement that has a value which is farther numerically from the arithmetic mean ($\bar{x}$) than the other ones of the plurality of utility measurements;

(c) using the extreme utility measurement $x_{e,i}$ to calculate an extreme studentized deviate R_i;

(d) calculating a 100α percent critical value λ_i for the extreme utility measurement $x_{e,i}$; and

(e) declaring the extreme utility measurement $x_{e,i}$ to be an outlier when the extreme studentized deviate R_i is greater than the 100α percent critical value λ_i.

10. (Previously Presented) The method as recited in claim 9 wherein the Generalized Extreme Studentized Deviate (GESD) statistical procedure further comprises:

removing the extreme utility measurement $x_{e,i}$ from the plurality of utility measurements to form a new plurality of utility measurements; and

repeating steps (a) through (e) for the new plurality of utility measurements.

11. (Original) The method as recited in claim 9 wherein the extreme studentized deviate R_i is calculated according to the expression:

$$R_i = \frac{\left| x_{e,i} - \bar{x} \right|}{s}$$

where s is a standard deviation of the plurality of utility measurements.

12. (Previously Presented) The method as recited in claim 9 wherein the 100α percent critical value λ_i is calculated using the equation:

$$\lambda_i = \frac{(n-i)t_{n-i-1,p}}{\sqrt{(n-i+1)(n-i-1+t^2_{n-i-1,p})}}$$

where n is the number of utility measurements, i is a number identifying a particular outlier being evaluated, $t_{n-i-1,p}$ is a student's t-distribution with (n-i-1) degrees of freedom, and p is a value based on a user defined probability of α of incorrectly declaring one or more outliers when no outliers exist.

13. (Previously Presented) The method as recited in claim 12 wherein the percentile p is determined from:

$$p = 1 - \left(\frac{\alpha}{2(n-i+1)} \right).$$

14. (Currently Amended) A method for determining abnormal consumption of a utility by a system, comprising:

(a) repeatedly measuring a level of use of the utility, thereby producing a plurality of utility measurements;

(b) forming a group of those of the plurality of utility measurements taken during predefined periods of time;

(c) calculating an arithmetic mean ($\bar{x}$) of the group;

(d) finding an extreme utility measurement $x_{e,i}$ which is the utility measurement having a value that is farthest numerically from the arithmetic mean ($\bar{x}$);

(e) using the extreme utility measurement $x_{e,i}$ to calculate an extreme studentized deviate R_i;

(f) calculating a 100α percent critical value λ_i for the extreme utility measurement $x_{e,i}$;

(g) declaring the extreme utility measurement $x_{e,i}$ to be an outlier indicative of abnormal utility use and adding the outlier to a set of outliers when the extreme studentized deviate is greater than the 100α percent critical value;

(h) removing the extreme utility measurement $x_{e,i}$ from the group of utility measurements;

(i) repeating steps (c) through (h) for a defined number of times;

(j) removing the set of outliers from the group of utility measurements to define a set of non-outliers; and

(~~j~~k) evaluating performance of the system in response to ~~any~~ the set of outliers and the set of non-outliers ~~identified~~ by determining a severity of abnormal utility usage represented by ~~a given~~each outlier, wherein determining a severity of abnormal utility usage for each outlier comprises calculating how ~~many standard deviations the given~~far each outlier is from ~~the average~~ a robust estimate value for utility usage determined from the set of non-outliers.

15. (Previously Presented) The method as recited in claim 14 wherein the extreme studentized deviate R_i is calculated according to the expression:

$$R_i = \frac{|x_{e,i} - \bar{x}|}{s}$$

where s is a standard deviation of the utility measurements in the group.

16. (Original) The method as recited in claim 14 wherein the 100α percent critical value λ_i is calculated using the equation:

$$\lambda_i = \frac{(n-i)t_{n-i-1,p}}{\sqrt{(n-i+1)(n-i-1+t^2_{n-i-1,p})}}$$

where n is the number of utility measurements, i is a number identifying a particular outlier being evaluated, $t_{n-i-1,p}$ is the student's t-distribution with $(n\text{-}i\text{-}1)$ degrees of freedom, and p is a value based on the user defined probability α of incorrectly declaring one or more outliers when no outliers exist.

17. (Previously Presented) The method as recited in claim 16 wherein the percentile p is determined from:

$$p = 1 - \frac{\alpha}{2(n-i+1)}.$$

18. (Original) The method as recited in claim 14 further comprising defining periods of time during a plurality of days in which under normal conditions similar utility consumption levels occur during each one of those periods of time.

19. (Original) The method as recited in claim 14 further comprising performing maintenance on the system in response to examination of one or more of the outliers.